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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/575,055	05/19/2000	Q.Z. Liu	99CON114P	2945

25700 7590 07/26/2005

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EXAMINER

LUU, CHUONG A

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/575,055

Applicant(s)

LIU ET AL.

Examiner

Chuong A. Luu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 28-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claims 28-31 have been considered but are moot in view of the new ground(s) of rejection.

## PRIOR ART REJECTIONS

### Statutory Basis

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### The Rejections

Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuno et al. (U.S. 6,110,842) in view of Liu et al. (U.S. 6,271,127 B1).

Okuno discloses an integrated circuit with

**(28)** covering a first area in a dielectric layer, said dielectric layer having a first dielectric constant;

exposing a second area in said dielectric layer to a dielectric conversion source so as to increase said first dielectric constant of said dielectric layer in said second area to a second dielectric constant (see Figures 1A-1C);

**(29)** covering a first area of a dielectric, said dielectric having a first dielectric constant;

exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant (see Figures 1A-1C);

**(30)** covering a first area in a dielectric, said dielectric having a first dielectric constant;

exposing said second area of said dielectric layer to a dielectric conversion source so as to increase said first dielectric constant of said dielectric layer in said second area to a second dielectric constant; wherein said covering said first area in said dielectric prevents said first area from being exposed to said dielectric conversion source (see Figures 1A-1C);

**(31)** covering a first area in a dielectric, said dielectric having a first dielectric constant;

exposing a second area in said dielectric to a dielectric conversion source so as to increase said first dielectric constant of said dielectric in said second area to a second dielectric constant; wherein said covering said first area in said dielectric prevents said first area from being exposed to said dielectric conversion source (see Figures 1A-1C).

Okuno teaches the above outlined features except for etching a plurality of capacitor trenches in said second area in said dielectric layer; wherein said dielectric conversion source is selected from the group consisting of E-beams, I-beams, an amine

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based chemical. and an oxygen plasma. However, Liu discloses a method of fabricating a semiconductor device with **(28)**.. etching a plurality of capacitor trenches in said second area in said dielectric layer; wherein said dielectric conversion source is selected from the group consisting of E-beams. I-beams, an amine based chemical. and an oxygen plasma (see column 2, lines 45-59); **(29)**.. wherein said dielectric conversion source is selected from the group consisting of E-beams. I-beams, an amine based chemical. and an oxygen plasma (see column 2, lines 45-59); **(30)**.. etching a plurality of capacitor trenches in a second area in a dielectric layer, said dielectric layer having a first dielectric constant; wherein said dielectric conversion source comprises an amine based chemical (see column 3, lines 24-35); **(31)**.. wherein said dielectric conversion source comprises oxygen plasma (see column 3, lines 24-35). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teaching of Okuno (in accordance with the teaching of Liu) to fabricate a semiconductor device. Doing so would facilitate the manufacture of the semiconductor device and improve the speed of the semiconductor layer.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CAL  
July 25, 2005



David Nelms  
Supervisory Patent Examiner  
Technology Center 2800